Benefits of linking public health, animal health, and food safety surveillance

Elroy Mann

In many countries, there is increasing pressure to integrate surveillance of public health ("disease surveillance") with surveillance of the risk factors that may precede public health events, now frequently referred to as "surveillance of exposure" (SOE). In Canada, this pressure comes from several sources, including the government departments responsible for public health, terrorism prevention, and safe food production.

Justification for such pressure may differ somewhat for different classes of disease. For infectious diseases, it relates to a growing awareness of the importance of the human/animal/environment interface in understanding disease ecology (the recognition that many zoonotic agents are transferred to humans through their exposure to animals, animal products, feces, or common vectors). It is also now understood that genetic factors (virulence and antimicrobial resistance) can be transferred among different organisms; including between pathogens and nonpathogens, and that there is a growing environmental reservoir of organisms that are virulent, resistant, or both.

Surveillance involves the regular collection of population-based data, the analyses required to turn data into knowledge, the dissemination of the knowledge to decision makers, and the actions undertaken to prevent disease. Surveillance may be passive (using data already collected for other purposes) or active (collecting data according to a defined plan relating to a particular condition).

Health Canada, during its reorganization over recent years, undertook a number of national health surveillance programs, including the Canadian Integrated Public Health Surveillance (CIPHS) project, designed to improve the data management and analysis tools available to those responsible for surveillance. Several CIPHS initiatives enable and encourage the integration of surveillance data.

First, a comprehensive data model has been developed for the management of data relating to multiple subject types; including human, animal, food, and environment. A laboratory data management system (LDMS), based on this model, is in use in several federal laboratories and will be tried out in animal health in Newfoundland and Labrador. A pilot study between the Laboratory for Foodborne Zoonoses (LFZ) and the University of Guelph has demonstrated the technical feasibility of transferring data from a non-CIPHS system to the CIPHS data model by using an intermediate structure conversion and nomenclature translation process.

Second, the Public Health Information System (PHIS), case management software adopted from British Columbia Centres for Disease Control, has been enhanced. A collaborative group made up of representatives from ministries of health in a number of provinces and territories with support from the CIPHS is planning pilot studies in several jurisdictions over the next year.

Third, the CIPHS and the LFZ are encouraging and supporting the development of province-based data repositories for the integration of public health surveillance and SOE. An environmental survey conducted in British Columbia by the Centre for Coastal Health for the LFZ has indicated a desire among all interviewees for such integration. However, the survey identified the need for funding and personnel for secure data storage and extraction, as well as dedicated veterinary public health professionals to help to define the data with public health relevance (sentinel value) and to conduct the routine analyses that result in useable alerts concerning health risks.

The reference laboratories at the LFZ manage passive SOE data repositories relating to *Salmonella* and *Escherichia coli* isolated from nonhuman sources. An active surveillance pilot study on *Salmonella* resistance patterns at slaughter plants is being developed in cooperation with the Canadian Food Inspection Agency (CFIA). A surveillance pilot study for tracking antimicrobial resistance in bacteria isolated from retail fresh meat products is also being developed. Proposed "on-farm food safety" programs being initiated under the Agriculture Policy Framework of Agriculture and AgriFood Canada to encourage safe food production processes will provide the opportunity to complete the SOE of zoonotic pathogens in the food chain. The CIPHS data repositories will store the data from these pilot studies.

The veterinary profession and animal health laboratories are in the position to make a major contribution to the management of risks to human health by assisting in SOE. Veterinary diagnostic services collect useful data during case management. The CFIA collects useful data in its import, export, and disease control programs, and in its issues management database. The Canadian Animal Health Laboratorians, as an organization representing a large cross section of animal health and food safety services of the country, could contribute significantly to the ability to share these data by working on

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the standardization of disease definitions and laboratory test definitions. This organization could also have considerable influence with those allocating funds, by actively supporting the development of SOE databases and the formation of a national network for veterinary public health. Current funding initiatives for preventing terrorism and planning food production policy provide urgent opportunities for veterinary organizations to expand their mandates in the area of public health, while enhancing their ability to deliver on their current programs.

SPECIAL REPORT

RAPPORT SPÉCIAL

Emergency preparedness: A veterinary and animal health community challenge.....and obligation

Brian Evans

"The only thing more difficult than preparing for a disaster is trying to explain why you didn't"(1).

The challenges facing the veterinary and animal health community in Canada in preparing effectively for an animal health, veterinary public health, or food security emergency, whether the introduction be accidental, incidental, or deliberate, are significant. Not only are risk pathways for the introduction of hazards changing, but so is the very nature of the hazards themselves. Globalization of the food supply, agricultural inputs, and genetic resources for production, when multiplied by the volume of people and goods that are moved as a result of the integration of commerce, immigration, demographics, and agricultural diversification, ensures that global pandemics of disease will occur.

While it may be a harsh and simplistic judgement, a retrospective assessment of the performance of the veterinary and animal health community in emergency preparedness on a global basis over the past decade would suggest a less than sterling performance. Delayed or misdiagnosis of disease, fragmentation of the animal health and veterinary public health communities, poor risk communication, and questionable reporting practices have contributed to several highly visible and unfortunate events. Society expects and demands better.

The profound social and economic consequences to Canada and Canadians resulting from any delay in the detection or diagnosis of a foreign, new, or emerging pathogen, or hazard, warrant that the present obstacles to a producer or veterinary practitioner detecting or reporting, or a diagnostic laboratory diagnosing or reporting, must be recognized and addressed. Equally, the lessons so painfully learned in other jurisdictions over the last several years must become part of our continuous improvement and vigilance in Canada and hemispherically. Investments must be made to our veterinary infrastructure, in our academic institutions and curricula, and our diagnostic competency and capacity.

Uncommon things are increasingly common. To the extent possible, we must collectively strive to create a seamless, interdependent sense of community with a common resolve to support awareness, actively consider the possibility of an untoward event within diagnostic rule-outs and submissions, and increase the synergies between all sectors. We will all, most certainly, be judged accordingly.

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Reference

1. Los Angeles County Task Force on Disaster Preparedness.